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of the Lower Mekong Basin

TONLE SAP BARRAGE (MEKONG VALLEY)
PROJECT INVESTIGATIONS

Progress Report of the work done by the Indian Mekong Tonle Sap Team for the period ending September 1962

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1. INSPECTIONS

(a) Shri P.R. Ahuja, Chief Engineer, Central Water and Power Commission and the Project Manager for the Tonle Sap Project, inspected the progress of investigations in June 1962.

(b) Mr. Ammstrong of Burmah-Shell Film unit visited the Prek Kdam and Kompong Chhnang sites in June 1962.

(c) Mr. Kanwar Sain, the Acting Executive Agent of the Mekong Committee, Bangkok, visited Cambodia during August 24 to August 28 and again from August 31 to September 4 and held discussions with the Field Manager on various questions pertaining to the Tonle Sap investigations and also paid field visits to the Grand Lake, some of the Lake tributaries and the Tonle Sap river, both by land as well as by boat.

2. PERSONNEL

Mr. J.T. Karira, Research Officer of the Indian Team who arrived in Phnom Penh on May 2, left for New Delhi on July 31, 1962 for official consultations with headquarters.

3. EQUIPMENT FROM INDIA

Orders were placed for the procurement of practically all the drawing and mathematical instruments and most of the laboratory equipment and equipment for field investigations required to be sent from India. Orders for the drilling equipment and accessories have also been placed. A good part of the equipment has been since shipped and the first consignment of cases containing equipment for the proposed soil and concrete laboratory and field surveys etc. shipped from India has since been received at Phnom Penh and stored.

/4. EQUIPMENT

4. EQUIPMENT FROM NEW ZEALAND FUNDS

All the equipment ordered in January 1962 from Soil Test Inc. USA, Geophysical Specialities USA, and Messrs. Beckman USA, have been received. For all the items received, the material is carefully verified and a certificate of verification is endorsed on the firms' invoices which are then sent to the Mekong Committee Secretariat, Bangkok, through the UN Regional Representative, Phnom Penh, for arranging payment. The invoices for all items have been sent to Bangkok duly verified exception for the Bishop sand sampler supplied by Soil Test which will be verified in the near future.

No equipment has so far been received from Messrs. Leonard Farnell of England.

In response to a reference earlier made to the Executive Agent of the Mekong Committee for arranging procurement of additional equipment, worth $10,000 for the proposed soils and concrete laboratory, quotations were called for by him from 11 firms. Only 2 quoted for one item each, while 3 regretted their inability to submit the proposals. The remaining 6 firms did not give any reply. Particulars of a few more firms have since been furnished to the Executive Agent and further necessary action has been taken by him.

In consultation with and through the good offices of Mr. Van Riet of the Mekong Committee it was decided in the first fortnight of June, to place a firm order on Messrs. Pongsoviwat Ltd., Bangkok, for the supply of a 30' boat fitted with a Chevrolet gasoline engine. This order was however not placed because subsequent enquires revealed that they would not be in a position to deliver the boat in a reasonable time.

The Executive Agent also authorized the purchase of a small used aluminium boat fitted with outboard motor from the Certeza Surveying Co. But the inspection of the outboard motors showed that they were not in good condition and Certeza did not favour the sale of only the boat without the outboard. Hence this deal also did not go through. Efforts are continuing to obtain the boats and the motors.

/5. SUB-SURFACE

5. SUB SURFACE INVESTIGATIONS AT KOMPONG CHHNANG

A high priority was given to the work of sub-surface investigations at Kompong Chhnang in the period under review, because knowledge of the sub-surface conditions of the Tonle Sap river at Kompong Chhnang between the western hill of Phnom Krang Romeas and the eastern hill of Neang Kang Rey has an important bearing on the precise location of the proposed barrage. In this investigation, the following three methods have been adopted:

(i) Open test pit excavation to the extent possible
(ii) Use of engineering seismograph, and
(iii) Driving casing pipes and collecting samples at different sub-surface elevations by wash borings.

Open test pits could not be excavated deep enough, because of ground water conditions. In almost all the pits, sub-soil water was encountered within 3 metres below ground level and continued to flow in at such a rate that open pumping did not materially affect the position. However, the open excavation helped in exposing the top two or three layers, a knowledge of which proved very useful in the interpretation of the results by the other two methods.

The conclusions of the investigations done so far may be stated briefly as below:

On the west bank of the Tonle Sap slightly to the north of the Kompong Chhnang town at several places, a layer of decomposed laterite with concretions was encountered immediately below a thin layer of top soil. According to the nature of the samples of the over-burden collected above elevation -6.00, it did not appear likely that suitable hard rock would be met with above elevation -10.00 m.

On the east bank, the indications offered by a flew test pits and seismic traverses are that a thick layer of clay lies over a sub-surface layer of harder material, whose hardness appears to be increasing from the river towards the hill Neang Kang Rey.

/Further

Further explorations will be made to investigate the nature of sub-soil and foundation conditions at Kompong Chhnang.

6 (a) TOPOGRAPHIC SURVEY

Topographic survey was done at Kompong Chhnang consisting of laying out a tentative axis between Phnom Kong Romeas on the west bank and Nean Kang Rey on the east across the islands in the river and laying down two lines, one half a kilometre upstream and the other half a kilometre downstream. These axes served as the basis for the sub-surface investigations described above. A brief traverse was run connecting these axes with the traverse line established by the Certeza Surveying Company at the request of the Indian Team in May, 1961.

Levelling was done along the axis across the islands and on both banks connecting the base line established by the Certeza Surveying Company on the Kompong Chhnang-Pursat road in the vicinity of Phnom Krang Romeas to indicate the ground levels at sites selected for sub-surface investigations.

Also levelling was done between the Bench mark at the Post Office building in Kompong Chhnang town with the water level of the Tonle Sap at Kompong Chhnang port to serve as a check on the water level observations at Kompong Chhnang.

At Kompong Luong, upstream of the Prek Kdam ferry, three tentative axes were laid across the river, out of which one was selected as the axis for the proposed barrage at this place, connecting the road in the heart of Kompong Luong town on the west bank with Prek Kdam-Skoun road on the east.

Ground signals were established both at Kompong Chhnang and at Kompong Luong to facilitate sounding operations in the month of July to complete the cross-sections.

In cooperation with the personnel of the Cambodian Department of Navigation and the UN Special Fund Hydrographic Study team for the Mekong, soundings of the river bed across the selected axis were taken at Kompong Luong, slightly to the north of the Prek Kdam Ferry on July 12, 1962 and

/similar souding

similar soundings were taken in the various channels at Kompong Chhnang on July 13 and 14.

In order to provide the basis for a study of variations in the river bed levels along the full length of the river, a longitudinal profile of the river was taken from Phnom Penh to Snoc-Tru, a distance of about 140 km With the help of a boat and an echo-sounder taken temporarily for the purpose from the Port authories at Phnom Penh on September 14 and 15, 1962. A similar operation was done in December 1961 when the flow was from Snoc Tru to Phnom Penh,

During September, soundings were taken across the river at Kompong Tache, along a line connecting the Vat Taches on the west bank to the school in Phnom Phum Thmoll Krom on the East bank.

Levelling is being done on the land area to the west of Kompong Taches and soundings are being taken to the east of Phum Thmoll Krom.

6 (b) TOPOGRAPHIC MAPPING

Discussions were held by the Project Manager, Shri P.R. Ahuja, at Phnom Penh on 7 June 1962 in the office of the Director of the Service Géographique Khmer, with the representatives of the S.G.K., the USA Army Map Service, the Certeza Company and the Mekong Committee on the mapping requirements for Tonle Sap investigations.

It was understood that the ground control computations by the US Army Map Service for the Kompong Chhnang area would be completed by 1st September, 1962 whereafter the preparation of topo maps to the scale of 1 in 10,000 would take another 2 months by the SGK so that topo maps at Kompong Chhnang would become available by the end of November.

In the meantime, Certeza promised to complete their ground control by end of June and furnish the data at Kompong Chhnang to the Indian team (since received).

/In so far

In so far as Prek Kdam area is concerned, for which ground control was already obtained by S.G.K. from USAMSFE, Tokyo, the S.G.K. informed that they have already commenced their work on the preparation of the map and hoped it would be completed by end of June (since received).

During the period under review, continuous consultations were kept up by the field staff with S.G.K., USAMSFE and Certeza Company on matters relating to topographic survey and mapping.

A plan of the area at Prek Kdam to the scale of 1 in 10,000 with contour intervals of 5 m was prepared by the S.G.K. and transmitted to us. The field work done at Kompong Luong and the results of the soundings were plotted on this map.

Similarly a cross-section of the Tonle Sap at Kompong Chhnang was prepared on the basis of surveys between Phnom Krang Romeas and Phnom Neang Kangrey.

Ground control data along the traverse and level lines run by Certeza Company in response to the request of the Indian Team in May 1961 was collected from them. This data includes the data from Phnom Neang Kangrey up to Barai on the Siemreap road on the east.

Thus the cross-section prepared between Phnom Krang Romeas and Phnom Neang Kangrey together with the data supplied by Certeza between Neang Kangrey and Barai provide a complete cross-section of the Tonle Sap at Kompong Chhnang extending from road to road.

On the basis of information readily available with the Cambodian Ministry of Public Works, Roads Department, a site survey was prepared for the area in the vicinity of the bridge at km 54 on Prek Kdam-Skoun Road through which passes a considerable quantity of the Mekong back spill into the Tonle Sap. This site survey is only tentative as it is derived from available records. A more detailed field survey will be done in the next working season, if the Prek Kdam site is finally selected.

/The data

The data referred to above is under examination in the design unit of CWPC at New Delhi.

7. SELECTION OF SITE FOR THE LOCATION OF THE BARRAGE

Apart from the field investigations, being conducted by the Indian team necessary for the preparation of designs and cost estimates in the first stage, a number of collateral investigations by other agencies and participating programmes were outlined in Appendix F of the Plan of Operations as being essential to be made available to the Indian team for the preparation of comprehensive project report. The requirements of collateral investigations were reviewed in detail by Shri P.R. Ahuja, the Project Manager, during his visit to Cambodia in the first week of June 1962 with the representatives of various other interested agencies like the Mekong Committee, Departments of the Royal Cambodian Government, UNTAB, and French teams for delta model, fisheries, sedimentation and hydrology.

So far only two sites have been under investigation, one at Kompong Chhnang and the other at Prek Kdam. However, during his last inspection visit (July-August), the Acting Executive Agent of the Mekong Committee, Mr. Kanwar Sain, suggested that investigations be made of a third site in between Prek Kdam and Kompong Chhnang. This would extend from Kompong Taches on the west bank, passing through Phnom Thmoll Krom on the East Bank, to Pa Av on the Skoun Road. Area maps to the scale of 1 in 100,000 show the locations of these places. Accordingly a high priority is being given now to the field work at Kompong Taches for the preparation of a draft report on the choice of site. The fact that the river level is now high and rains are frequent, presents some problems in the type of work that has to be done at Kompong Taches, but every effort is being made to complete the operations as early as possible in spite of rains.

8. TONLE SAP FISHERIES

The problem of the Tonle Sap barrage vis-a-vis the Tonle Sap fisheries was discussed in detail by the Project Manager during his June visit to Cambodia

/with the

with the representatives of the Royal Cambodian Government and the French Fisheries Mission. Based on these discussions, a report has been prepared on various aspects concerning the development of Fisheries and the proposed barrage on Tonle Sap. This report was based on a number of personal discussions on various facts of the problem with the Cambodian Department of Fisheries and the personnel of the French Fisheries Mission by the Project Manager and the Field Manager. The report has recently been forwarded to the Mekong Committee secretariat in Bangkok for their information and necessary action.

9. DATA COLLECTED FROM OTHER AGENCIES

Hydrological data on Purset, Mongkol Borey and Siemreap tributaries has already been collected from USAID.

Similarly data in respect of the Battambang tributary has already been collected from the SOGREAH.

Messrs. Harza International Co. have transferred all their operational responsibilities and the data to the Cambodian Government from May 1, 1962. Hydrological data from the Cambodian Government authorities is now being collected.

With respect to the data collection from Viet-Nam a letter has been received from the Saigon authorities suggesting that a personal visit to Saigon will help to sift out what exactly is needed by the Indian team.

Hydrological data available with the Cambodian Ministry of Public Works, is being collected in so far as the Tonle Sap at Kompong Luong des Lacs, Snoc Tru, Kompong Chhnang, Kompong Taches, Stung Sen, Phnom Penh Port is concerned. After this is completed, data for the Mekong proper in Cambodia will be collected.

It is gathered that Harza International have submitted to the Mekong Committee their final report along with data volumes. The Mekong Committee is being requested to make two copies of this available to us. This data would constitute the reliable basis for design and would cover not only all the data collected by Harza themselves but also some historical data together with rating curves.

/In the meantime,

In the meantime, meteorologic data from the Cambodian service of Meteorology is being collected.

10. OFFICE AND LABORATORY ACCOMMODATION

The Cambodian Government have placed two rooms in the Salle des Conférences at the disposal of the Indian team to serve as their office accommodation.

Discussions are continuing with the concerned Cambodian officials on suitable accommodation to set up the Soil and Concrete Laboratory. No final decision has as yet been taken. But in the meantime, the Cambodian Government have been kind enough to place at the disposal of the Indian team two rooms in the basement of the Salle des Conférences to keep the equipment already received.

Although two rooms are being occupied in the basement of the Salle des Conférences, these rooms are at present being used only for storing the equipment already received, in the absence of official authorization to set up the Laboratory in the basement. Informal enquiries made from Mr. Khiou Bonthonm, the Secretary Général of the Technical Commission of the Cambodian National Mekong Committee and Mr. Chann Pech, the counterpart Manager for the Indian Tonle Sap investigations reveal that the question of official authorization is now before the Prime Minister of Royal Cambodian Government. Efforts are being made to obtain this authorization through normal official channels as expeditiously as possible.

11. DESIGN UNIT IN CWPC AT NEW DELHI

The Government of India have since sanctioned the required staff for the Design Unit in CWPC at New Delhi out of which some staff are already in position. The full complement of staff, shall be posted as soon as the complete data of the project becomes available.

On the basis of the data available so far the following drawings have been prepared:

/(i) Gauge

(i) Gauge and discharge hydrographs for Mekong at Phnom Penh and Tonle Sap at Prek Kdam sites.

(ii) Mass curves showing the inflow and outflow curves of Great Lake.

(iii) G & D curves of the main items (a) Mekong, above and below Phnom Penh and (b) Tonle Sap.

(iv) Tentative cross-section of the barrage (spillway portion) at Prek Kdam.

The studies of the hydraulic design of the barrage at Prek Kdam site are being finalized, while these of the barrage at Kompong Chhnang will be taken up shortly.

12. CENTRAL WATER AND POWER RESEARCH STATION, POONA

The estimate for the construction and operation of hydraulic models of Mekong river (including Great Lake) and barrage across Tonle Sap is being processed.